

Customer No.: 31561
Docket No.: 12119-US-PA
Application No.: 10/710,421

REMARKS

Present Status of the Application

The Office Action rejected all presently-pending claims 1-28. Specifically, the Office Action rejected claims 1-8 and 9-12 under 35 U.S.C. 103(a), as being anticipated by Sheu et al. (U.S. 2002/0179914). The Office Action rejected claims 13 and 14 under 35 U.S.C. 103(a) as being unpatentable over Sheu et al. in view of Yonezawa et al. (U.S. 2004/0157432). The Office Action rejected claims 15-26 under 35 U.S.C. 103(a) as being unpatentable over Sheu et al. in view of Ikeda (U.S. 6,900,698). The Office Action rejected claims 27-28 under 35 U.S.C. 103(a) as being unpatentable over Sheu et al. and Ikeda and further in view of Yonezawa et al..

Applicants have amended claims 1 and 15 and canceled claims 9 and 23 to more clearly define the present invention. After entry of the foregoing amendments, claims 1-8, 10-22 and 24-28 remain pending in the present application, and reconsideration of those claims is respectfully requested.

Discussion of Office Action Rejections

Applicants respectfully traverse the rejection of claims 1-8 and 9-12 under 103(a) as being unpatentable over Sheu et al. (U.S. 2002/0179914) because a prima facie case of obviousness has not been established by the Office Action.

To establish a prima facie case of obviousness under 35 U.S.C. 103(a), each of three requirements must be met. First, the reference or references, taken alone or combined, must

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teach or suggest each and every element in the claims. Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the references in a manner resulting in the claimed invention. Third, a reasonable expectation of success must exist. Moreover, each of the three requirements must "be found in the prior art, and not be based on applicant's disclosure." See M.P.E.P. 2143, 8th ed., February 2003.

The present invention is in general related to a flip chip light-emitting diode package as claim 1 recites:

Claim 1. A flip chip light-emitting diode package, comprising:
a Schottky diode comprising;
 a submount having a first surface and a second surface;
 an ohmic contact layer, disposed on a portion of the first surface and the second surface of the submount; and
 a Schottky contact layer, disposed on a portion of the first surface of the submount and *electrically contacts with the submount*, wherein the ohmic contact layer and the Schottky contact layer are electrically isolated; and
a light-emitting diode, disposed on the Schottky diode by flip-chip bonding process, wherein the light-emitting diode and the Schottky diode are connected reverse and in parallel.

Sheu fails to disclose, teach or suggest the feature of that *the Schottky contact layer electrically contacts with the submount*. In Fig. 2B of Sheu, the diode 40 includes an n-doped silicon layer 42, a p-doped silicon layer 44 and a pair of metallic layers 46a, 46b. The electrodes 38a, 38b of the diode 30 respectively electrically contact with the metallic layers 46b, 46a of diode 40. In particular, the metallic layer 46a is disposed on the p-doped silicon layer 44 over the n-doped silicon layer 42. In other words, the metal layer 46a electrically contacts with the p-

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doped silicon layer 44 but does not electrically contact with the n-doped silicon layer 42. The metal layer 46a and the n-doped silicon layer 42 are electrically isolated by the p-doped silicon layer 44. Therefore, Fig. 2 of Sheu does not disclose the feature of that the Schottky contact layer electrically contacts with the submount as claim 1 recites.

Moreover, in Fig. 5 of Sheu, the metal layers 321 and 322 are formed on an insulating substrate 324 so that the metal layers 321, 322 and the isolating substrate 324 are not electrically connected to each other. Fig 5 of Sheu also fails to disclose the Schottky contact layer electrically contacts with the submount. Hence, the combination of Fig. 5 and Fig. 2 of Sheu does not teach every element of claim 1

For at least the foregoing reasons, Applicants respectfully submit that independent claim 1 patently define over the prior art reference, and should be allowed. For at least the same reasons, dependent claims 2-8 and 10-12 patently define over the prior art as a matter of law.

Applicants respectfully traverse the rejection of claims 13-14 under 103(a) as being unpatentable over Sheu et al. (U.S. 2002/0179914) in view of Yonezawa et al. (U.S. 2004/0157432) because a prima facie case of obviousness has not been established by the Office Action.

Applicants submit that, as disclosed above, Sheu fails to teach or suggest each and every element of claim 1 from which claims 13-14 depend. Yonezawa also fails to teach the Schottky contact layer electrically contacts with the submount. Yonezawa cannot cure the deficiencies of

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Sheu. Therefore, independent claim 1 is patentable over Sheu and Yonezawa. For at the least the same reasons, its dependent claims 13-14 are also be patentable.

Applicants respectfully traverse the rejection of claims 15-22 and 23-26 under 103(a) as being unpatentable over Sheu et al. (U.S. 2002/0179914) in view of Ikeda (U.S. 6,900,698) because a prima facie case of obviousness has not been established by the Office Action.

The present invention also provides another flip chip light-emitting diode package as claim 15 recites:

Claim 15. A flip chip light-emitting diode package, comprising:
a Schottky diode group having a plurality of Schottky diodes, wherein the Schottky diodes are electrically connected in series, in parallel or in series and parallel together, each of the Schottky diodes comprises:
a submount having a first surface and a second surface;
an ohmic contact layer, disposed on a portion of the first surface and the second surface of the submount; and
a *Schottky contact layer*, disposed on a portion of the first surface of the submount and *electrically contacts with the submount*, wherein the ohmic contact layer and the Schottky contact layer are electrically isolated; and
a light-emitting diode disposed on one of the Schottky diodes by flip-chip bonding process, wherein the light-emitting diode and the Schottky diode group are connected reverse and in parallel.

As discussed above, Sheu fails to teach that the Schottky contact layer electrically contacts with the submount of the Schottky diode. Ikeda also fails to teach said feature. Ikeda cannot cure the deficiencies of Sheu. Therefore, independent claim 15 is patentable over Sheu and Ikeda. For at the least the same reasons, its dependent claims 16-22 and 24-26 are also be patentable.

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Applicants respectfully traverse the rejection of claims 27-28 under 103(a) as being unpatentable over Sheu et al. (U.S. 2002/0179914) and Ikeda (U.S. 6,900,698) and further in view of Yonezawa et al. (U.S. 2004/0157432) because a prima facie case of obviousness has not been established by the Office Action.

Applicants submit that, as disclosed above, Sheu and Ikeda fail to teach or suggest each and every element of claim 15 from which claims 27-28 depend. Yonezawa also fails to teach the Schottky contact layer electrically contacts with the submount. Yonezawa cannot cure the deficiencies of Sheu and Ikeda. Therefore, independent claim 15 is patentable over Sheu, and Ikeda and Yonezawa. For at the least the same reasons, its dependent claims 27-28 are also be patentable.

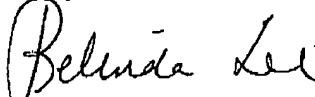
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CONCLUSION

For at least the foregoing reasons, it is believed that the pending claims are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

Date: Nov-7, 2005

Respectfully submitted,


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